

Tech Tots: Bridging the Gap Between Technology and Early Childhood Education

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Literature Review

Digital Foundations: Preparing Preschoolers for a Technological Future

In today's rapidly evolving digital landscape, the lack of technology integration in preschool education presents a significant problem that can hinder children's development and preparedness for future learning environments. As young learners engage with technology daily at home, preschools that fail to incorporate digital tools may risk leaving children at a disadvantage. The proposed solution involves implementing age-appropriate technology through iPads, fostering engagement, and promoting essential skills. By embracing this approach, preschools can create a more enriching learning environment, better prepare children for future educational challenges, and ultimately enhance their overall development. Research will demonstrate that integrating technology addresses the current gaps in preschool education and equips children with the tools they need to thrive in a digital world. This literature review will explore the ongoing issue of limited technology use in early childhood education, examine evidence of its impacts on skill development, and highlight effective strategies for integration.

From Cost Concerns to Classroom Benefits

In our district, the integration of technology within early education is currently limited. Recognizing that there may be concerns about the necessity of incorporating technology at this developmental stage is important. "There are many thoughts and opinions regarding the cost readiness and cost effectiveness during implementing e-learning in education sectors" (Abdullah et al., 2017). The challenge also lies in the preparedness of educators. As Taimur et al. (2021) highlight, "Teachers were not trained to implement digital education, which impeded effective teaching practice." Addressing this issue requires not only funding for professional development but also resources for technology, such as iPads and educational software. Despite these

challenges, I am confident that the benefits of technology for young learners justify the investment. Plus, if students are already engaging with technology at home, it is logical to consider its integration into the school environment. As Mattoon et al. (2015) note, "If children's experiences prior to school are changing to include digital technology, and they are naturally seeking it out for learning or entertainment purposes, then early childhood educators should consider examining their curriculum and personal pedagogies in relation to the potential of this technology."

Technology as a Complement to Hands-On Learning

Pre-kindergarten students can benefit from using technology as a complement to traditional hands-on activities, rather than as a substitute. A study titled "Using Tablets in a Prekindergarten Classroom to Foster Phonological Awareness" examined two groups of students: one engaged in traditional learning methods and the other using tablets. The research aimed to assess any differences in phonological awareness between the two groups. At the conclusion of the study, the author observed no significant differences in overall phonological awareness between the two groups. However, it is noteworthy that the traditional group initially demonstrated higher skill levels compared to the tablet group. The study revealed that the use of tablets was effective in closing this initial gap, as evidenced by the increase in phonological awareness among the tablet group (Shifflet et al., 2020). This suggests that technology, when implemented thoughtfully, can bridge educational gaps and enhance learning outcomes. Clearly, technology should be utilized in conjunction with traditional methods, particularly for students who are struggling. Research supports this approach, demonstrating that "technology is more effective than traditional printed texts in training phonological skills and developing phonological awareness, and in the acquisition of reading and writing in preschoolers, especially

those who have difficulties learning to read" (Raposo-Rivas et al., 2024). Additionally, another study highlights the effectiveness of technology integration, noting that "computer-assisted instruction software, specifically the WEL program, has been effective in helping participants attain the emergent literacy, reading, and math skills they need for early academic success" (Shamir et al., 2016). This evidence underscores the significant potential of technology to enhance early phonological development and support academic achievement.

The Benefits of Assistive Technology

Technology offers significant benefits beyond enhancing early literacy skills; it also serves as a crucial tool for supporting students with disabilities. Assistive technology can provide tailored support to address diverse learning needs, facilitating greater access to educational opportunities and improving overall learning outcomes for students with disabilities. By providing specialized tools, "access to appropriate assistive technology can support students' educational engagement, increase well-being and academic self-efficacy and have a positive impact in the areas of competence, adaptability and self-esteem" (McNicholl et al., 2023). One assistive technology tool that could be particularly beneficial for pre-kindergarten students is the text-to-speech app. Many young children in this age group are not yet proficient readers. Research suggests that text-to-speech technology plays a significant role in enhancing reading skills, especially in e-learning environments, by providing auditory reinforcement and supporting early literacy development. (Dessy et al., 2022). There are systems and tools designed to assist young children with following single-step tasks, recognizing that children in this age group often struggle with multi-step instructions. According to research, "technology systems designed to present single-step instructions can be effective in teaching or supporting the independent performance of multi-step activities by people with intellectual disabilities, with or without other

disabilities” (Desideri et al., 2021). While these assistive tools are often utilized for children with disabilities, they can also offer significant benefits to all pre-kindergarten students. Such tools or apps on an iPad can enhance engagement and focus, which in turn may contribute to improved learning outcomes and academic performance.

The Importance of Digital Literacy

Lastly, introducing technology to pre-kindergarten students is crucial for fostering digital literacy. As Lee (2009) notes, "The ability to use a mouse is a prerequisite skill for computer activity, regardless of age." Moreover, Mashyhura (2022) highlights that "the digital literacy school environment impacts the learning process significantly." It is essential for our students to develop digital literacy so they are kindergarten-ready and can avoid frustration or difficulties due to unfamiliarity with technology. Early exposure to technology equips young learners with the foundational skills necessary for their educational development. Additionally, as Riyanti et al. (2023) assert, "Utilizing learning technologies and applications, students can enhance their digital abilities, gain a more dynamic and enjoyable understanding of topics and principles, and prepare for a future that is increasingly dependent on technology." These skills not only support students in their academic journey but also prepare them for future success in the workforce.

Importance of Intentional Digital Instruction

According to the Pre-K guidelines, technology can enhance active, hands-on, creative, and authentic engagement with others and the world; however, it must be used with intentionality. This means that educators should thoughtfully integrate technology to support learning objectives and foster meaningful interactions. By carefully selecting tools and resources, teachers can create enriching experiences that promote critical thinking, collaboration, and

exploration among young learners. Intentional use ensures that technology complements rather than distracts from the learning process, ultimately enhancing children's overall development.

Preparing for Tomorrow

In conclusion, the integration of technology in preschool education is vital for bridging gaps in learning and preparing young learners for future academic success. This review demonstrates that using age-appropriate tools, such as iPads, can enhance engagement, support skill development, and foster essential digital literacy. Research shows that technology can effectively complement traditional teaching methods, especially for students who may struggle with foundational skills. By thoughtfully incorporating digital resources, preschools can create enriched learning environments that address diverse needs and promote overall development. As children increasingly interact with technology in their daily lives, embracing these tools within educational settings becomes imperative. This approach ensures that students are equipped with the necessary competencies to thrive in an increasingly digital world, making it a fitting solution for preschools committed to innovative and inclusive education.

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